

[0010] Reconfiguration can be used to expand the range of operational functions in a number of ways. First, the embedded array elements can be frequency tuned, and bandwidth can be improved by using reconfiguration to broaden the bandwidth of the embedded elements. In addition, for high gain arrays, beam squint is usually the limiting factor on instantaneous bandwidth. Reconfiguration can alleviate this problem by providing control of the element phase centers. Scan coverage can be improved and scan blindness alleviated by controlling the embedded antenna gain patterns of the elements as well as by providing control of the active impedance as the beam is scanned. Applying limited phase control to the elements themselves can alleviate some of the complexity of the feed manifold.

BRIEF SUMMARY OF THE INVENTION

[0011] The invention disclosed here provides reconfigurable antenna arrays designed by selectively placing load impedances in the aperture of the individual antenna elements within an antenna array. These loads can be controlled to change the operational characteristics of the individual antenna element. These characteristics include directivity control, tuning, instantaneous bandwidth, and RCS. By controlling the properties of the individual antenna elements within the array, the performance properties of the array can be changed.

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[0012] Specifically, this invention builds on parent application No. 10/206,101 that describes the use of loaded parasitic components within the radiating aperture of an antenna element for the purpose of controlling the RF properties of the antenna element. It also describes the use of a feedback control subsystem that is part of the antenna system which